PART A

Answer ALL questions: **1 x 10 = 10**

1. How many pn junctions are present in JFET?
2. Define DC load line.
3. Draw the circuit diagram of a four bit R-2R ladder network DAC.
4. Define modulation index of an AM wave.
5. How many sidebands are present in FM wave?
6. Mention one application of TRIAC.
7. Write the Boolean expression of XNOR gate.
8. Write the excess-3 code of $(304)_{10}$.
9. Which sign is used in as mnemonics for Indirect addressing mode?
10. Name the standard input and output functions used in C

PART B

Answer any FIVE questions: **5 x 2 = 10**

11. Write the advantages of voltage divider bias circuit.
12. Mention the steps involved in drawing dc equivalent circuit of an amplifier.
13. Draw the block diagrams of voltage series negative feedback and current shunt negative feedback.
14. Expand CMRR? Give its value for ideal op-amp.
15. Explain briefly the conditions of Barkhausen criterion.
16. What is the difference between MOVC and MOVX instructions of 8051?
17. List the features of C language.
18. Distinguish between uplink and downlink signals.

PART C

Answer any FIVE questions: **5 x 3 = 15**

19. What are the functions of Drain, Source and Gate of JFET?
20. With a block diagram, derive an expression for input impedance of an amplifier with negative feedback.
21. Mention the characteristics of an ideal op-amp.
22. Explain the importance of ionosphere in the radio communication.
23. Briefly explain the function of an AM diode detector.
24. A silicon power diode has Vj (the drop across the p+n- junction) of 0.4V, RON (ohmic drop) in drift region of 0.002 Ω. Determine VAK if (a) IF = 75A and (b) IF =100A.
25. What is half-adder? Draw the logic diagram and truth table of half adder.
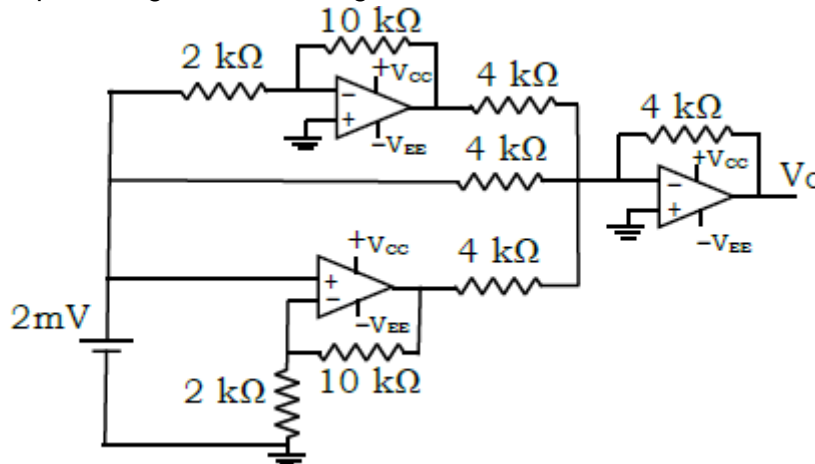26. Mention any three uses of internet.
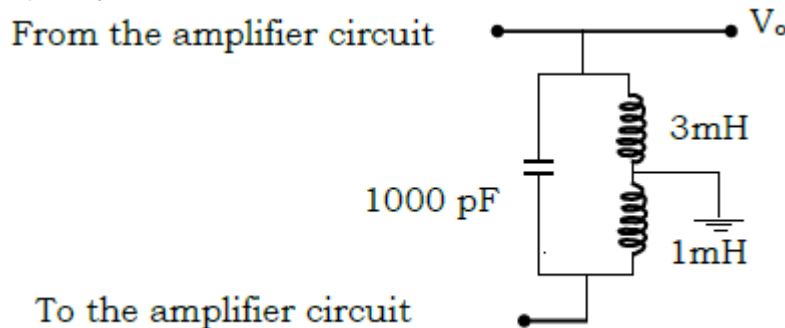
PART D

Answer any THREE questions: 3 x 5 = 15

27. For a CE amplifier circuit, R_1= 33kΩ, R_2 = 10kΩ, R_C = 2.2kΩ, R_E = 1kΩ, R_L = 10kΩ, V_{CC} = 10V, β = 100, V_{BE} = 0.7V. Find I_E, $Z_{in(base)}$, Z_O and A_V and A_P. Consider $r_e' = \dfrac{26mV}{I_E}$.

28. Calculate the output voltage in the circuit given below.

29. Calculate the frequency and feedback ratio of the circuit shown below.

30. An FM signal of amplitude 20V with single tone modulation has a frequency deviation of 15 kHz and a band width of 40 kHz. Find the frequency of the modulating signal, modulation index and carrier swing. Write the expression of FM wave.

31. Simplify the expression using K-map and draw the logic diagram for the simplified expression using NAND gates, given Y (A, B, C, D) = Σm(1,4,5,7,12,14,15) + Σd(3,6,13)

PART E

Answer any FOUR questions: 4 x 5 = 20

32. With a circuit diagram explain the working of CB amplifier. Draw the input and output wave forms. Mention one application.

33. Explain FM transmitter with a block diagram.

34. With a sketch explain the two transistor model of SCR. Derive an equation for anode current for zero gate current.

35. Explain the working of Clocked RS flip-flop using NAND gates. Write its truth table and timing diagram.

36. Write a program to add the values of locations 40H and 41H and store the result in locations 50H and 51H.

37. Write the basic structure of C program and explain each section in brief.